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## ATTENUATED HUMAN-BOVINE CHIMERIC PARAINFLUENZA VIRUS (PIV) VACCINES

### ABSTRACT OF THE DISCLOSURE

5 Chimeric human-bovine parainfluenza viruses (PIVs) are infectious and attenuated in humans and other mammals and useful individually or in combination in vaccine formulations for eliciting an anti-PIV immune response. Also provided are isolated polynucleotide molecules and vectors incorporating a chimeric PIV genome or antigenome which includes a partial or complete human or bovine PIV "background" 10 genome or antigenome combined or integrated with one or more heterologous gene(s) or genome segment(s) of a different PIV. Chimeric human-bovine PIV of the invention include a partial or complete "background" PIV genome or antigenome derived from or patterned after a human or bovine PIV virus combined with one or more heterologous gene(s) or genome segment(s) of a different PIV virus to form the human-bovine chimeric 15 PIV genome or antigenome.